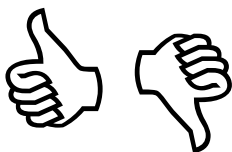


AP226 Expert Working Groups Workshop No.1

Held on Thursday 5 December 1996 at
Lloyd's Register House, Croydon, UK



Minutes of the Meeting

Present:

M Barrett	Ministry of Defence (UK)
Z Bazari	Lloyd's Register (UK)
K Brownlie	Consultant (UK)
J Clayton	Stone Manganese Marine (UK)
P Fitzsimmons	Lloyd's Register (UK)
J Flarup	Odense Steel Shipyard (Denmark)
J Fransman	Kvaerner Masa-Yards (Finland)
J Freeman	Lloyd's Register (UK)
H Johansson	KaMeWa (Sweden)
V Kozousek	Lloyd's Register (UK)
R Krapp	Germanischer Lloyd (Germany)
H Longley	P&O Containers (UK)
A Mechsner	HDW (Germany)
D Radosavljevic	Lloyd's Register (UK)
E Rod	Det Norske Veritas (Norway)
J C Thomson	New Sulzer Diesel Ltd (Switzerland)
T Yaghmai	Bureau Veritas (France)

Apologies

E G Story/D Favre	Marine Management System (USA/UK)
J Guy	VSEL (UK)
T van Beek	Lips BV (The Netherlands)
R Wood	Ingalls Shipbuilding (USA)
C M R Wills	Lloyd's Register (UK)

1. Introduction

The meeting was opened at 9.30 am by Mr. V. Kozousek, welcoming the participants and providing a brief background on Lloyd's Register's Technical Investigation, and Machinery Design and Dynamics Departments; both of which are directly involved in the AP226 project. He passed on apology for absence on behalf of J S Carlton, Head of the Technical Investigation Department.

Each participant then gave a brief summary of their background and current AP226-related interests within their respective companies.

2. AP226 Overview Presentation

Dr. Z Bazari gave a general overview of STEP standard and AP226 project. In particular the following topics were covered:

- STEP and its Objectives.
- the scope of STEP Application Protocols (APs).
- STEP Ship Product Model and other related APs.
- AP226 Scope.
- AP226 Major Components.
- AP226 Stakeholders and Industry involvement.
- Related Projects (Past and Current).

3. AP226 Progress Report

Following the general overview, Dr. Bazari proceeded with an outline progress report and the current status of AP226. The areas covered included:

- AP226 'Information Requirement' and its documentation as a 'data dictionary'.
- AP226 'Data Exchange Usage Scenarios' and its documentation as a 'usage guide'.
- Data Modelling

The emphasis was put on two key issues, Information requirement and Usage Scenarios. In order to facilitate efficient definition of information requirement the Ship Mechanical System has been broken down into smaller sub-systems and then further into 'Functional Units'. Three of the identified Functional Units have been broken down into sub-systems. Each component is given a definition. Life-cycle decomposition will also be applied as a next stage of specifying information requirements.

Dr Bazari presented examples of the identified usage scenarios and stressed that this issue must be given priority by EWGs members. He also presented the AP226 data modelling including few examples of explicit diesel engine data objects.

4. Walkthrough of "Ship Mechanical System Breakdown Structure"

The above document was handed over to those present and Dr Bazari briefly explained the content of the document. The following topics were covered in this walkthrough:

- Objectives of System Breakdown within AP226 framework.
- Data dictionary and its usage in AP226.
- Methodology adopted for system breakdown.
- The list of "Functional Units" of ship mechanical systems.
- Outline description of breakdown structure for "Diesel Engine", "Mechanical Transmission System" and "Propulsor".

5. Expert Working Groups Role

It was reported that the AP226 Team have concluded from the beginning that a formal involvement of “Application Experts” in the project is necessary. The overall role of EWGs was discussed and presented as:

- To provide experts’ opinion and consensus on AP226 development and implementation issues.
- To review and approve details of information needed to be represented in AP226.
- To review and approve AP226 data exchange scenarios.

At this stage of project progress the feed back from Experts on the following subjects are sought:

- AP226 scope and relevance for the industry.
- priorities in terms of Functional Units and lifecycle phases.
- related work that can be imported into AP226.
- detailed comments on the breakdown structure proposal, as described in Request for Comments (RFC) document distributed to each participant.

6. Expert Working Groups Plenary Discussion

During the AP226 presentation and afterwards there were a number of questions raised and discussed. The main questions and discussions are summarised below:

- **Scope of AP226?:** The scope is designed to satisfy requirements of shipyards, suppliers, ship owners/operators and classification societies. AP226 supports the full life-cycle of mechanical systems. The information relating to manufacturing are not covered by AP226.
- **Why Application Interpreted Model (AIM)?:** The need to treat ARM and AIM as completely separate issues is due to current STEP methodology and has been discussed significantly in the past. Based on this, AP226 approach is that application experts should concentrate on defining information requirements and to some extent develop ARM. The data modelling experts will translate the requirements into relevant data models at AIM level.
- **Change to Scope?:** Although AP226 scope has already been approved, there is a possibility to make modifications if there is a strong justification.
- **Data Security and Intellectual Property Right?:** STEP will not deal with technicalities of EDI (Electronic Data Interchange) but rather with data definition and data standardisation. As a result any question about intellectual property rights to data, data exchange security and so on should be handled directly between the parties involved in the exchange of information.
- **Size of STEP documents?:** The physical size of Standard’s documentation will depend on the scope of AP. It is possible to have several different APs, each one with smaller scope and documentation, or fewer APs with large size of documentation. It is generally felt that the size of standard should be kept to a minimum so that people are not deterred from either reviewing or using it.
- **Out of Scope Systems?:** The matter relating to who will take care of the ‘out-of-scope’ issues, such as ‘physical connectivity of machinery to “structure”, are still under discussion at STEP Ship Group meetings. Various experts raised the

question of interaction and interfaces between mechanical systems-to-mechanical systems and mechanical system to other ship systems in terms of data definition. The AP226 Team was asked to propose how to deal with this issue by next meeting.

- **Flexibility in Defining the Standard?:** The Standard should be valid for a longer period of time and the approach of system breakdown and information requirement for smaller sub-systems and groups of units allows for future modification. Data models should be defined in an 'open-ended' way and the meeting would like to see this approach.
- **Definition of Functional Systems?:** There is a need for some formal definitions of terms such as 'component', 'machinery unit' and a 'functional unit'.
- **Priority of Usage Scenarios?:** The importance of the "Usage Guide" was recognised by Experts to the point that a question was raised as to whether it should be given a priority over Information Requirement and data dictionary.
- **Reuse of Previous Work?:** It is recognised that the AP226 covers a massive scope which requires all available work to be incorporated. For example, system decomposition has already been done within different project frameworks and the process does not perhaps have to be repeated. However, STEP requirements for data exchange has to be satisfied and that requires systematic approach which must be carried out even if similar work has already been done, but with different objectives. EWG are expected to provide advice on this issue.
- **Manoeuvring System?:** The point was made that formal definition of a 'manoeuvring system' has not yet been formulated. This together with its decomposition to be provided by next meeting.
- **Use of Other Data Models?:** The question whether AP226 should develop its own data model or should make use of other ISO Standards will be possible to be evaluated once information requirements are clearly stated. In that respect the definition of maritime industry requirements is given priority and search for generic data model will be made on the basis of this requirement.
- **Other ISO Standards?:** Possible relevance of other ISO standards such as 'Parts Library' will be investigated at a later stage when requirements are fully defined.
- **Lifecycle Decomposition?:** When defining product data and information requirement, both physical breakdown and life-cycle decomposition should be combined to cover any data that may be required during any of the phases of system life cycle. This will effectively provide a functional view on the decomposed systems.
- **Breakdown Structure Document?:** Feedback from each expert and relevant EWGs should be provided so that a new revised document could be prepared by next meeting.
- **Electronic Mail?:** It was felt that from the practical and efficiency point of view it would be most useful to use e-mail for EWGs business.

7. Parallel meetings of EWGs

The parallel meetings of EWGs were held from 1.30 to 3.30 pm. Minutes of discussions are given in appendices 1 to 3:

8 Expert Working Groups Closing Plenary (3.30 to 4.30 pm)

At the closing plenary of EWGs, outline reports by each of the EWG was given. Some additional points were raised and discussed.

9. Outline list of Actions

The following list of actions was agreed:

Code	Description	Action
EWG1.1	Answers to general questions listed at the end of the “AP226 Presentation” document to be forwarded to AP226 Team.	All
EWG1.2	“Request for Comment” questionnaire to be completed by the participants or relevant experts in their respective organisations. Responses should be forwarded by mid-January.	All
EWG1.3	Based on the comments received as a result of action EWG1.2, AP226 Team will prepare a new document for revision at the next meeting.	ZB
EWG1.4	Question of cargo pumps with regard to being in or out of scope and their position in breakdown structure to be addressed by next meeting.	ZB & MT
EWG1.5	Question of the definition of manoeuvring system and its breakdown should be addressed by next meeting.	ZB
EWG1.6	A data exchange scenario, covering the early phase of ship lifecycle to be defined for the three selected Functional Units.	ZB
EWG1.7	Agenda for EWGs to be defined before the next meeting.	ZB, JF & PAF
EWG1.8	The ‘Functional Units’ connectivity to each other and other ship’s systems and data exchange between industry in this area to be investigated.	ZB & RK
EWG1.9	The question of tools and equipment, for removal and repair of mechanical systems, needs to be addressed with regard to being in or out of scope.	ZB
EWG1.10	EWGs members expressed their willingness in compiling their data requirement. This includes defining the level of decomposition and type of data which they would need to be exchanged. This matter to be investigated further for discussion in the next meeting.	All

9. Date and place of Next Meeting

Next meeting is tentatively put for the end of February 1997. It was suggested that future meetings could be arranged for two days, with a late start on the first day (to allow people to fly in from Europe), and early finish on the second day.

Appendix 1
Minutes of meeting
Diesel Engine Expert Working Group

Present: Z Bazari (LR), J Fransman (OSS), H Longley (P&O Containers), E Rod (DNV), J Thompson (NSD) and J Yaghmai (BV),

The following subjects were discussed:

1. Diesel Engine as a 'Functional Unit'

The participants agreed that diesel engine, as a package as supplied to shipyard, is a satisfactory choice as a functional unit.

2. Diesel Engine Breakdown Structure

Aspects of breakdown structure such as the completeness of system (e.g. inclusion of fuel injection system controls and exhaust emissions after treatment equipment) were discussed.

Further discussion will be carried out in the next meeting following review of the submitted document and also other breakdown systems.

3. Data Exchange Usage Scenario

A significant level of the group's discussions were devoted to this subject. An exchange scenario involving shipyard, supplier of diesel engine, owner/operator and class society was identified to be the initial phase of ship life-cycle. The group agreed that this phase (which cover 'initial specification' up to the point of 'engine delivery' to shipyard) needs to be taken as high priority phase and investigated further by member of the group until next meeting. Final decision will be made based on the findings of this exercise.

4. Exchange of Information for Type Approval

The engine 'Type Approval' is carried out by Classification Societies. A question was raised regarding where on the lifecycle type approval should be included. This will need to be investigated by classification societies.

Appendix 2
Minutes of meeting
Propulsor Expert Working Group

Present K. Brownlie (Consultant), J. Clayton (SMM), P. A. Fitzsimmons (LR),
 and H. Johanssen (KaMeWa)

The working group met during the AP226 EWG workshop No.1. Mr K Brownlie was introduced as the chairman.

The members considered some of the questions raised in the plenary session, in relation to the appropriateness of STEP for the participants' business, the relevance of the approach to STEP adopted by Lloyds' Register and the nature and extent of similar work in associated industrial fields.

Mr Clayton commented on the international nature of the propulsor business and in particular the need to involve the Far East yards. There was a need for unambiguous definitions of the 'product' in order to minimise costs and ensure that each party based their decision making on the same data.

Mr Johanssen indicated that further key concerns were in matters of safety and quality control.

All parties considered, that within their limited exposure to STEP, the approach adopted by LR appeared to be appropriate. The concept of expert groups was approved, however, there was concern that aspects of the shafting and engine were also relevant to the propulsor group. The members requested that information be exchanged among the groups. This was considered to be particularly important in terms of the interfaces between the propulsor and shafting system, and between the pitch actuating mechanism and the shafting.

Relevant work in other industrial fields was also discussed. The offshore and process industries were noted as potentially being ahead of the marine industry in terms of standardisation and also in terms of life-cycle and reliability data.

The work of MIT on propulsors was also of interest to the EWG as was the work referred to by Mr H Longley and Mr E Rod, in the STEP plenary session.

Mr Clayton commented that Stork-Nilsson were issuing design data on CD-ROM.

The key areas of interest to the EWG members were stated as Specification, Bid Preparation, Design and Operation in Service.

The group considered the grouping of propulsors and the breakdown of components as supplied by LR for discussion. The members agreed to consider these further and to communicate to LR any changes for consideration.

Appendix 3
Minutes of meeting
Transmission System Expert Working Groups

Present: J Freeman (LR), M Barrett (MOD), J Flarup (Odense Steel Shipyard), R Krapp (GL), and D Radosavljevic (LR).

1. Agreed approach

- Best method of developing and testing Breakdown Structure/ Data Dictionary was via Usage Scenarios.

2. Breakdown Structures/ Data Dictionaries

A brief exercise using various *Usage Scenarios* drawn from Tender, Design, Commissioning, Acceptance, and In-Service requirements produced the following preliminary observations with respect to present Transmissions Systems Breakdown Structure:

- Torsional/ axial vibration dampers to be included.
- Resilient mounts to be included. Performance characteristics to be included to allow through life performance assessment, i.e. ageing effects to be considered.
- Sensors/ instrumentation, e.g. torsion meters, speed probes etc. to be included.
- Because of their unique characteristics, screw shafts to be separately identified from intermediate shafts (either at Level 2 or Level 3).
- Similarly “A bracket/ stern tube” bearings and associated seals to be separately identified from inboard bearings and seals (either at Level 2 or Level 3).
- Contra-rotating propeller transmission systems to be included (scope/ connectivity to be clarified)
- Interface with CPP operating mechanism to be included (scope/ connectivity to be clarified).
- Interface with shaft generators/ boost motors to be included.
- Scope to be clarified with respect to:
 - Connectivity with ship's structure - flexibility data necessary for vibration & alignment analysis.
 - Connectivity with power unit and propulsor - input data necessary for analysis of dynamic characteristics of complete propulsion system.
 - Provision for maintenance/ repair routines, e.g. lifting points, special tools/ equipment, maintenance space envelopes - where do/ should these items feature in *Breakdown Structure/ Data Dictionaries/ Life Cycle Analysis*?
 - Condition monitoring systems.

3. STEP Awareness

Finally it was agreed that wider industry involvement in STEP was necessary. Key was seen as marketing exercise emphasising the commercial benefits of STEP. Such an exercise should cover ‘top level’ data exchange business benefits of STEP, avoiding complicated lower level ‘IT Speak’.

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